

Joint Judiciary Interim Committee
Wyoming Legislature

October 2, 2007



Pacific Power | Rocky Mountain Power | PacifiCorp Energy

What is the company's position on carbon policy?

“No one should underestimate the challenge of de-carbonizing an economy that has relied on carbon-based fuels for two centuries.”

**Testimony of David L. Sokol, Chairman and CEO
MidAmerican Energy Holdings Company
Subcommittee on Energy and Air Quality, Committee on Energy and Commerce
U.S. House of Representatives
March 20, 2007**

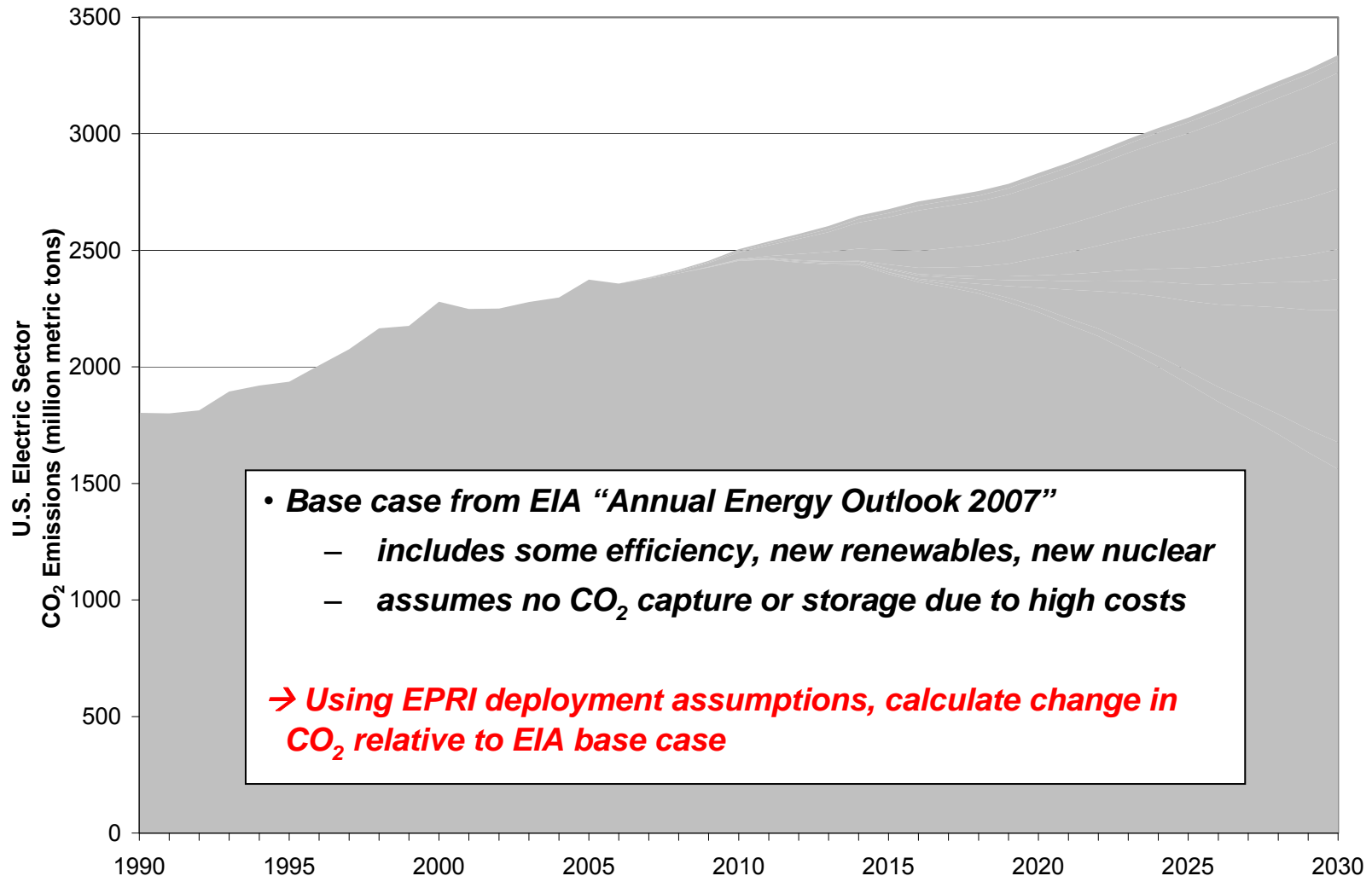


Key Technology Challenges

Significant cost-effective CO₂ reductions from the U.S. electric sector will require ALL of the following technology advances:

1. Smart grids and communications infrastructures to enable end-use efficiency and demand response, distributed generation, and PHEVs.
2. A grid infrastructure with the capacity and reliability to operate with 20–30% intermittent renewables in specific regions.
3. Significant expansion of nuclear energy enabled by continued safe and economic operation of existing nuclear fleet; and a viable strategy for managing spent fuel.
4. Commercial-scale coal-based generation units operating with 90+% CO₂ capture and storage in a variety of geologies.

U.S. Electricity Sector CO₂ Emissions

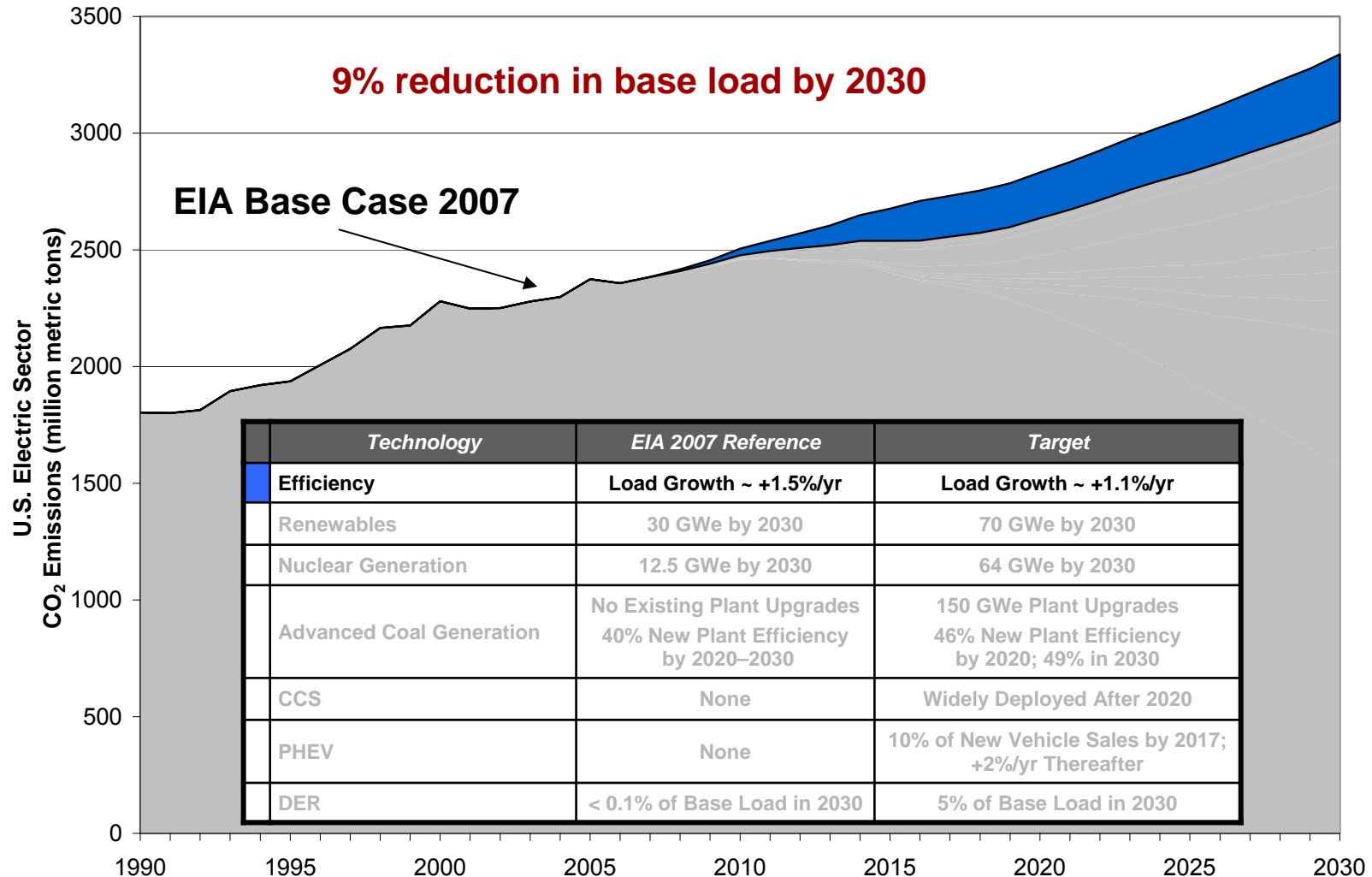


Technology Deployment Targets

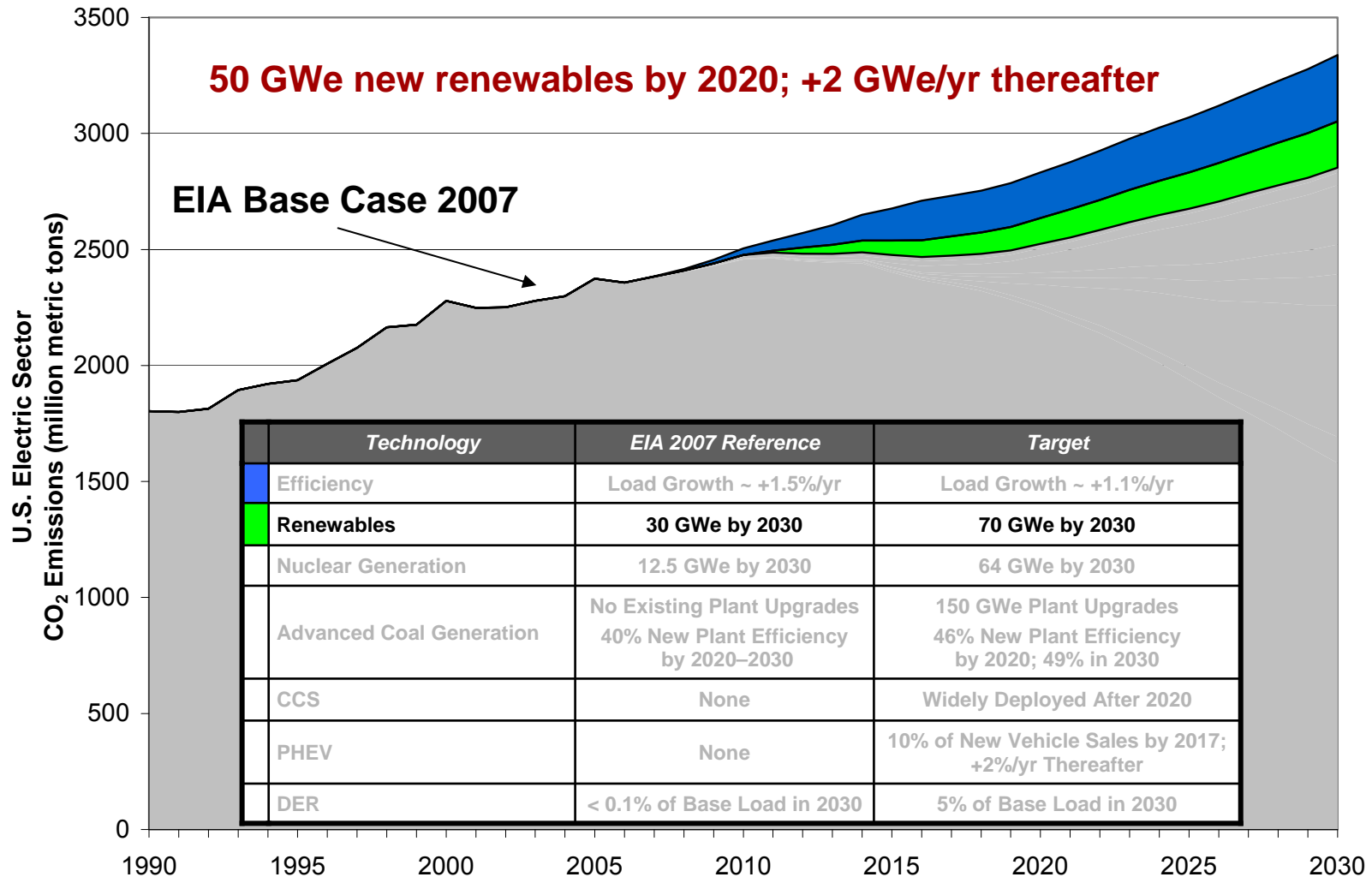
Technology	EIA 2007 Base Case	EPRI Analysis Target*
Efficiency	Load Growth ~ +1.5%/yr	Load Growth ~ +1.1%/yr
Renewables	30 GWe by 2030	70 GWe by 2030
Nuclear Generation	12.5 GWe by 2030	64 GWe by 2030
Advanced Coal Generation	No Existing Plant Upgrades 40% New Plant Efficiency by 2020–2030	150 GWe Plant Upgrades 46% New Plant Efficiency by 2020; 49% in 2030
Carbon Capture and Storage (CCS)	None	Widely Available and Deployed After 2020
Plug-in Hybrid Electric Vehicles (PHEV)	None	10% of New Vehicle Sales by 2017; +2%/yr Thereafter
Distributed Energy Resources (DER) (including distributed solar)	< 0.1% of Base Load in 2030	5% of Base Load in 2030

EPRI analysis targets do not reflect economic considerations, or potential regulatory and siting constraints.

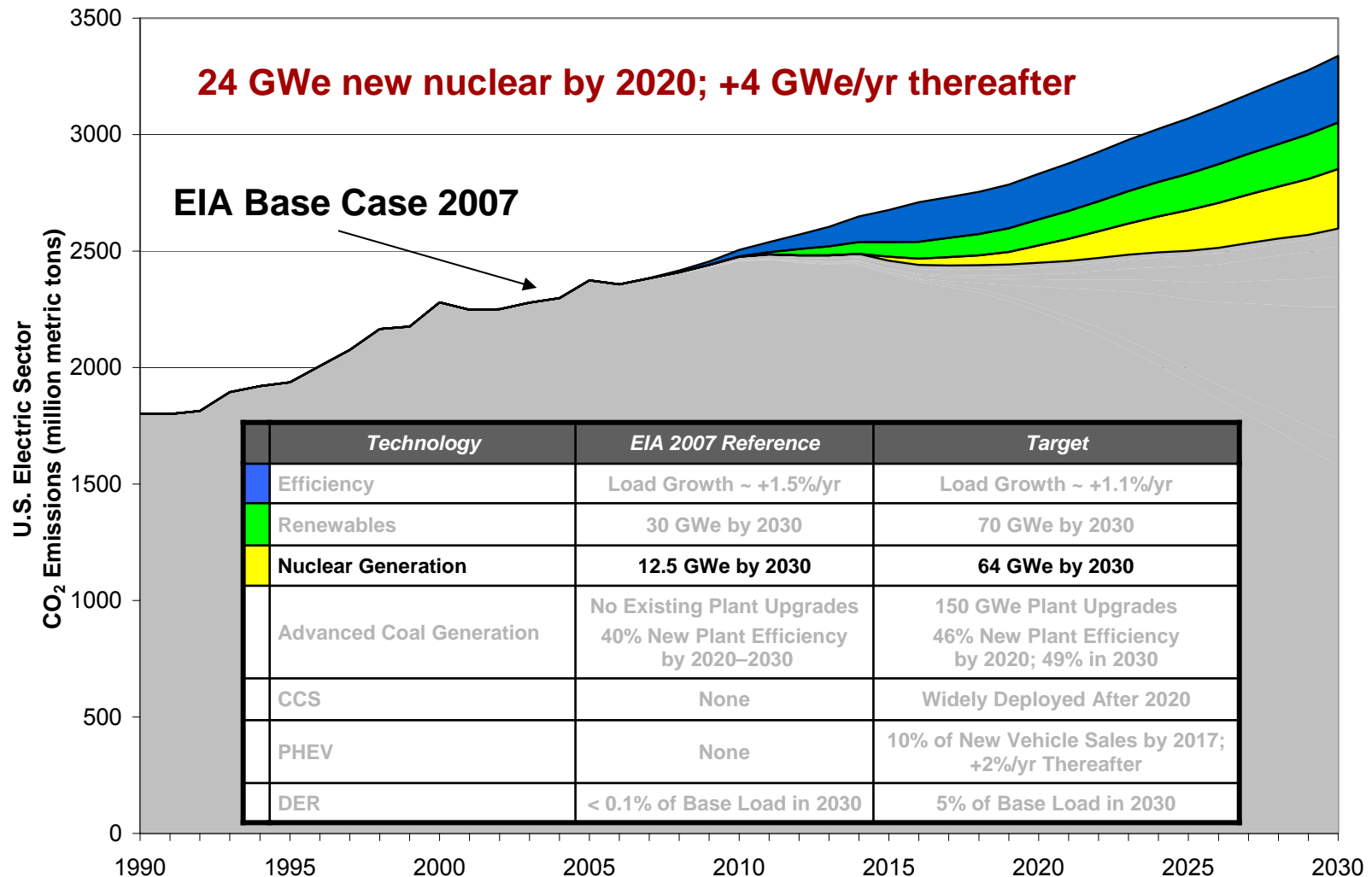
Benefit of Achieving Efficiency Target



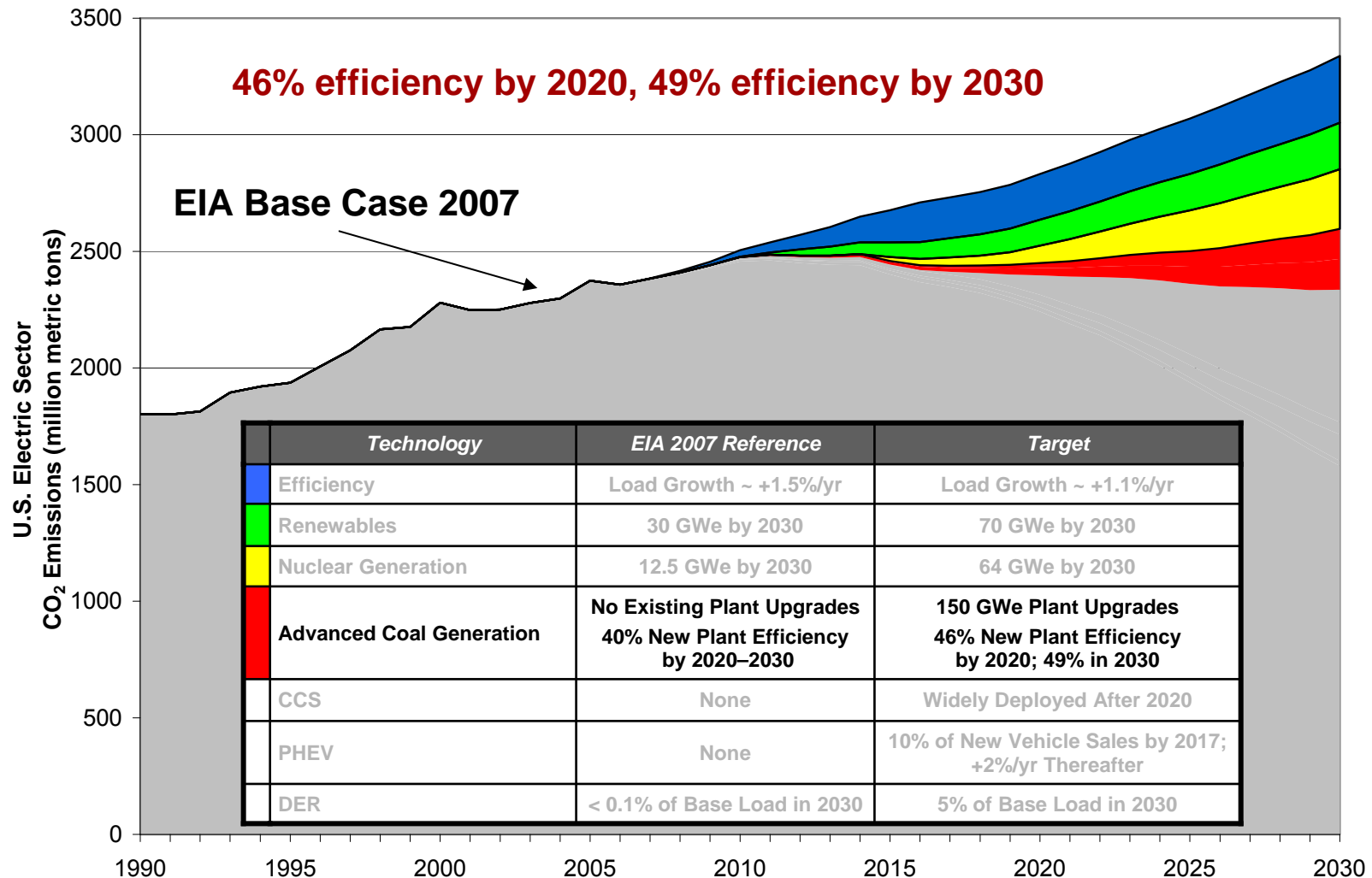
Benefit of Achieving Renewables Target



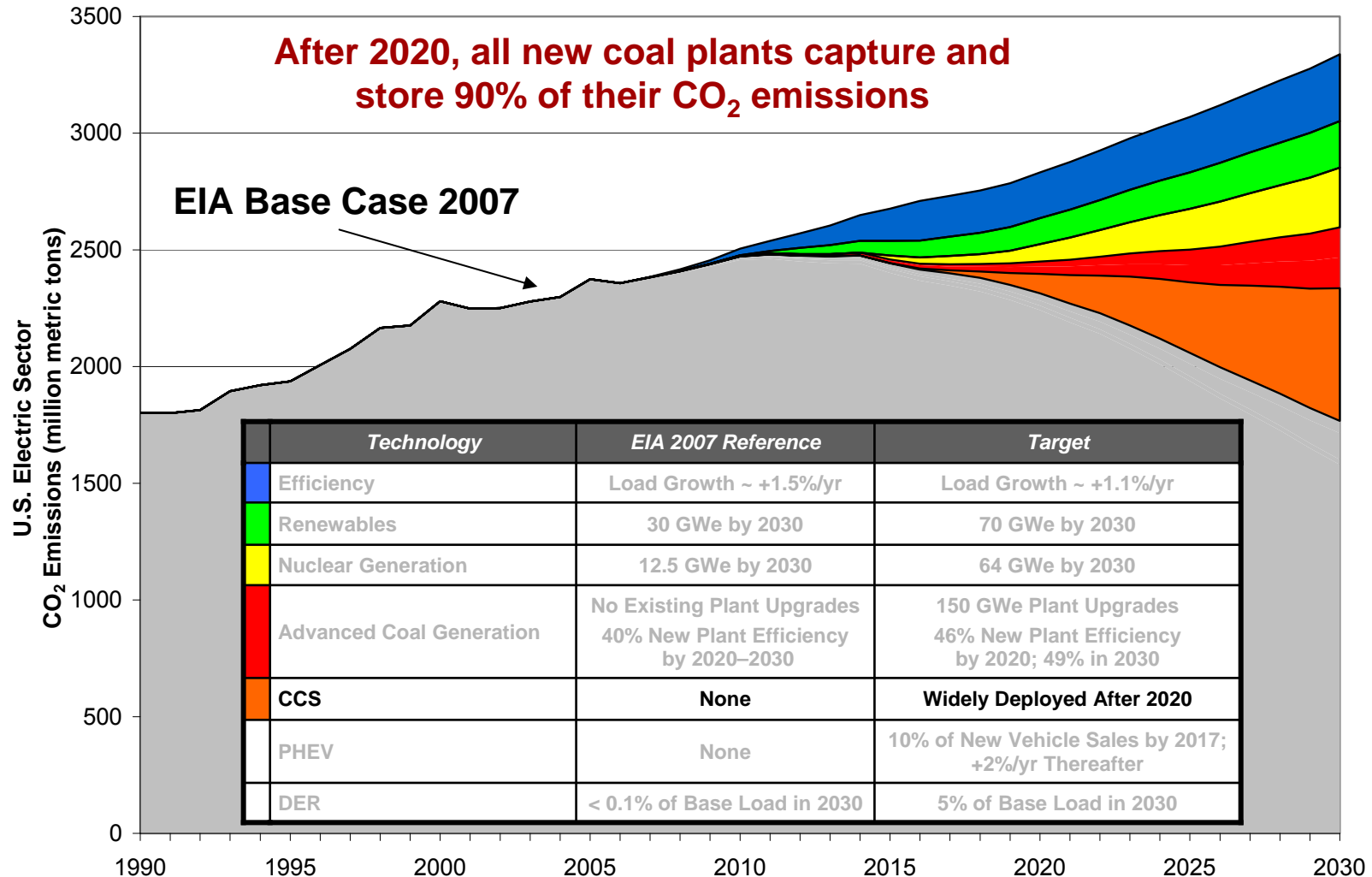
Benefit of Achieving Nuclear Generation Target



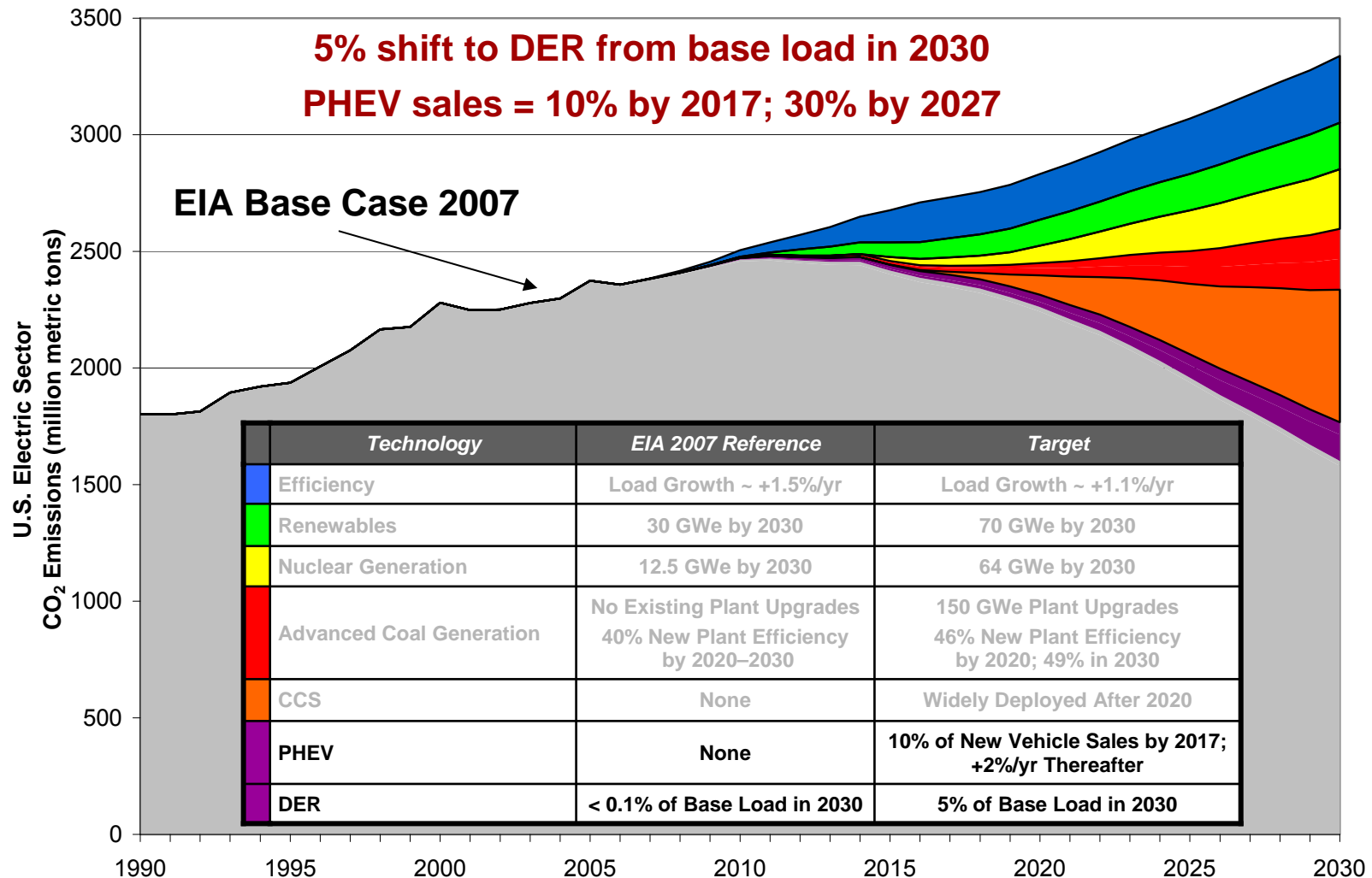
Benefit of Achieving Advanced Coal Target



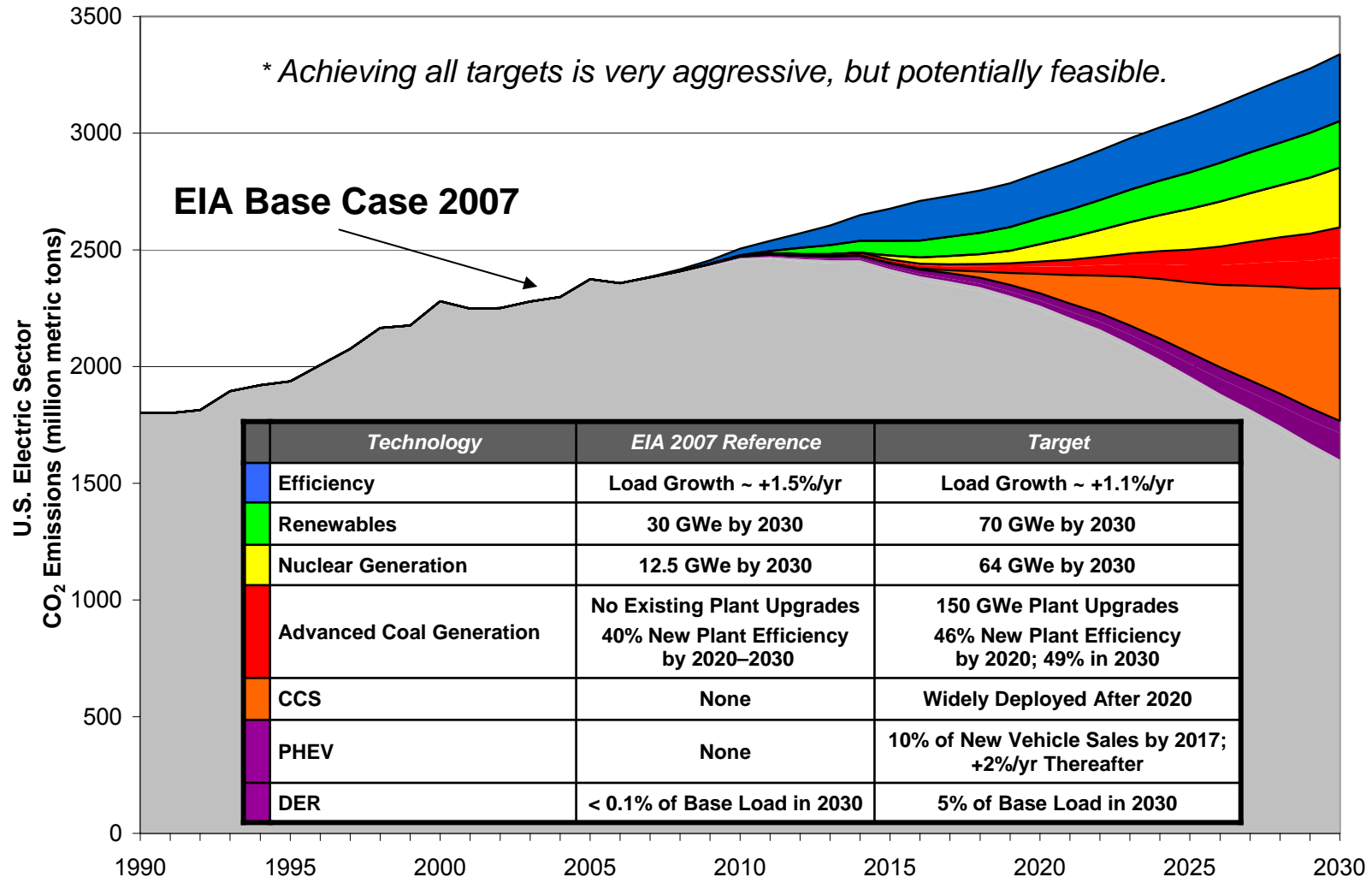
Benefit of Achieving CCS Target



Benefit of Achieving PHEV and DER Targets



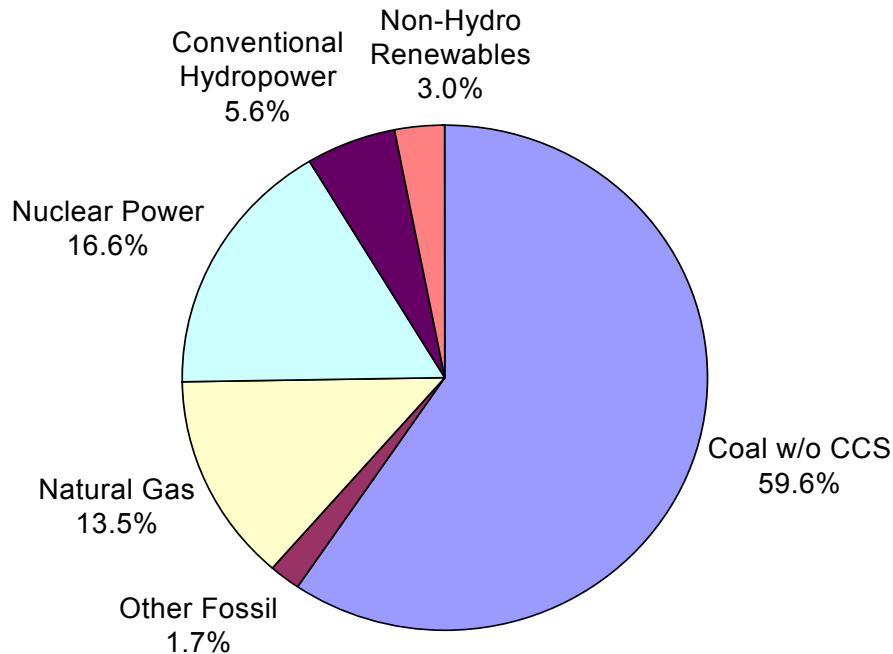
CO₂ Reductions... Technical Potential*



U.S. Electricity Generation: 2030

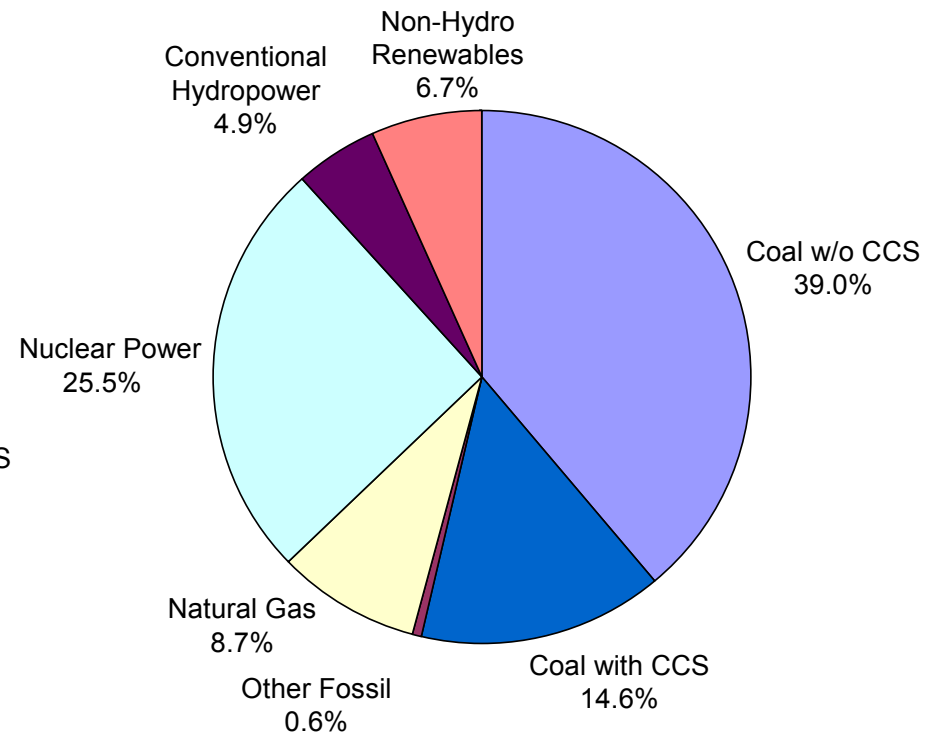
EIA Base Case*

5406 TWh



Advanced Technology Targets

5401 TWh



* Base case from EIA "Annual Energy Outlook 2007"

Kyle L. Davis

Manager of Environmental Policy & Strategy

PacifiCorp

825 NE Multnomah, Portland, OR 97232

(503) 813-6601 Phone

(503) 813-7247 Fax

E-Mail: Kyle.L.Davis@PacifiCorp.com

www.pacificorp.com

Appendices

The Science of Climate Change

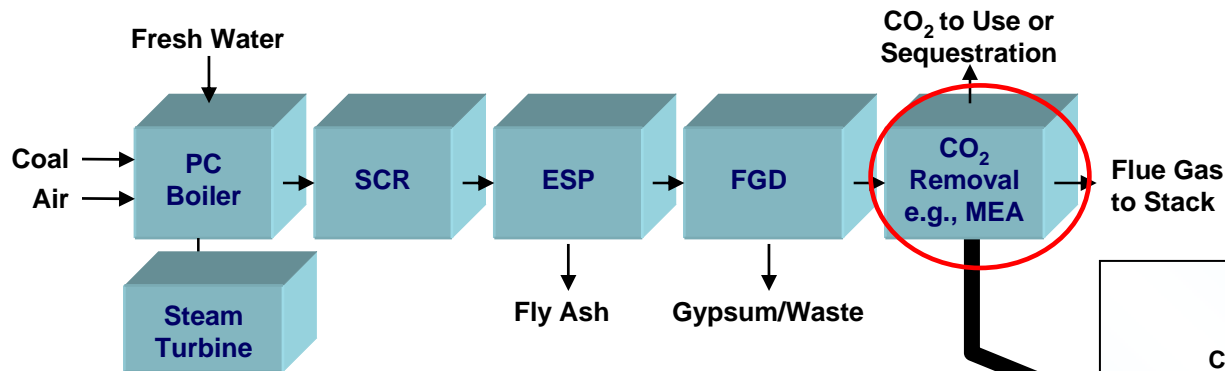
“The topic is too big and too complex for anyone to claim perfect information, particularly at this point in time. It seems to me that some general findings are becoming more clear, most specifically that the climate is warming and that human beings are contributing to this warming through the burning of fossil fuels.”

“However, as we attempt to move beyond this level of information to forecasting future impacts, there is far more uncertainty than certainty. We simply don’t know how much warming there will be or how much sea levels are likely to increase.”

**Testimony of David L. Sokol, Chairman and CEO
MidAmerican Energy Holdings Company
Subcommittee on Energy and Air Quality, Committee on Energy and Commerce
U.S. House of Representatives
March 20, 2007**

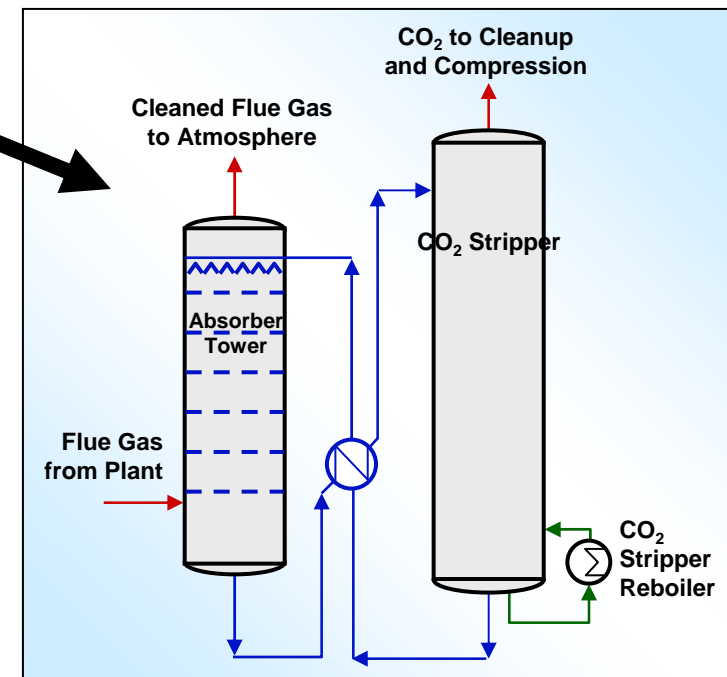


Pulverized Coal with CO₂ Capture (Today)



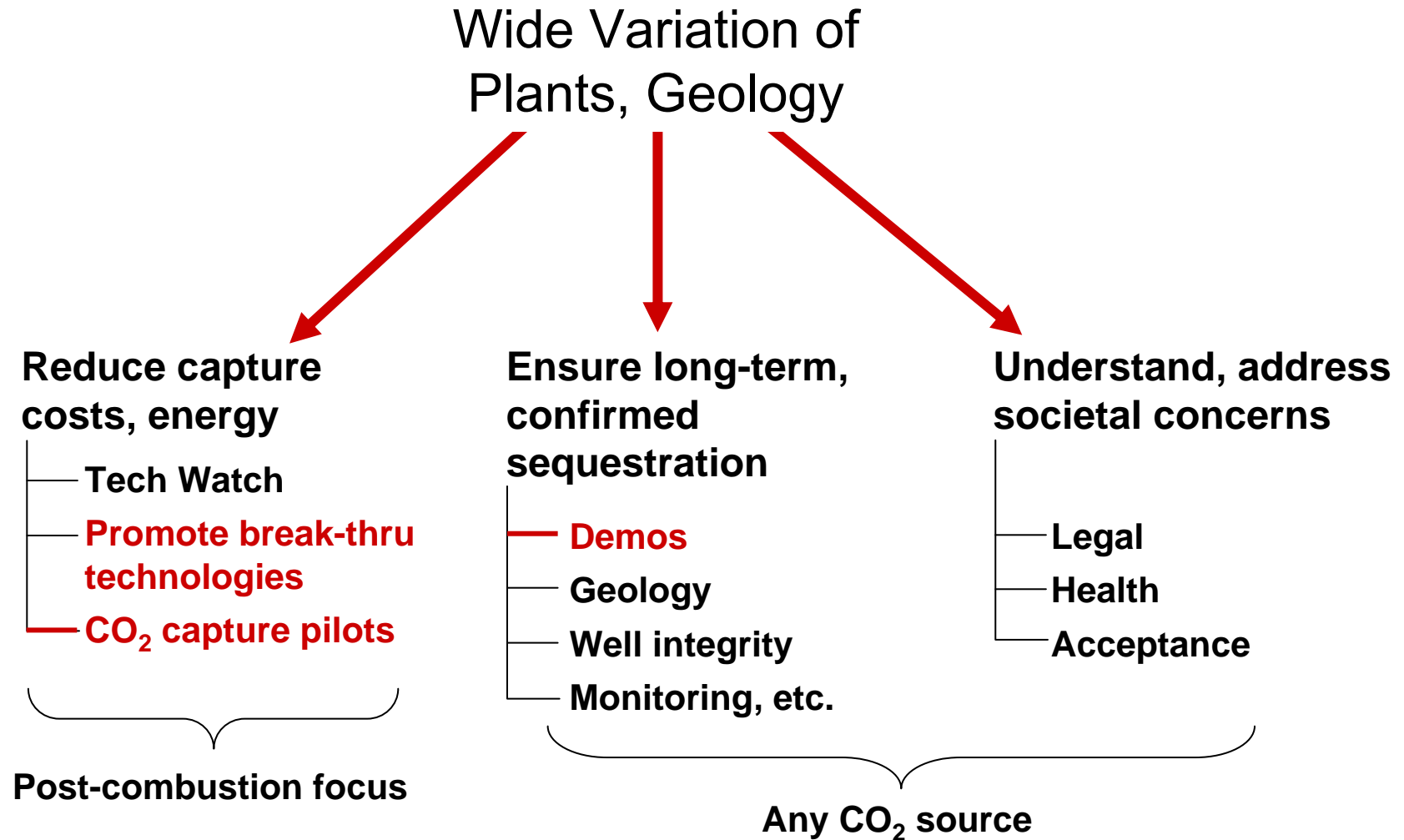
**Energy Penalty
~29%**

- Amine commercially available (multiple suppliers)
- 3 U.S. plants in operation:
 - MEA, <15 MWe, >90% ΔCO_2
- Key requirements:
 - ~5–6 acres for 600 MW plant
 - Near-zero SO₂ and NO₂
 - Large reboiler steam (MEA>KS-1>Ammonia)
- Many new process options being explored

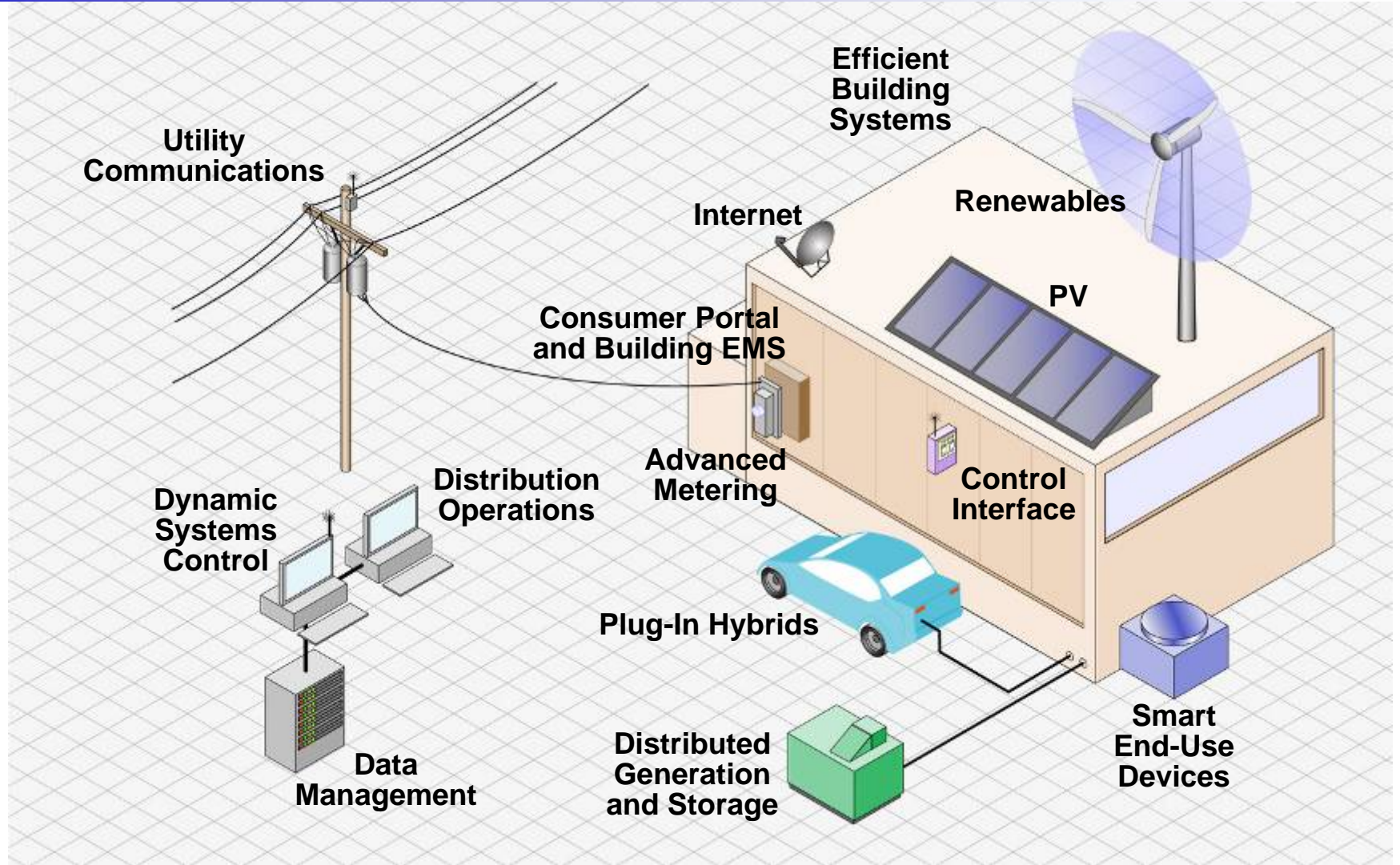


CO₂ Capture = \$, Space, Ultra-Low SO₂, and Lots of Energy.

CO₂ Capture and Storage – Research Needs



Intelligent Electricity Delivery Infrastructure



Estimates of Potential Energy Efficiency

